An Essay
On ASTHMA.

Respectfully submitted to the Faculty
of the
Homoeopathic Medical College
of Pennsylvania.
For graduation and degree
By George Washington Stearns
of Massachusetts
February 1 1858.

Atrophy.

There is a beautiful and wonderful adaptation of attributes to Specific purposes in every healthy organism.

There is also an appropriate independence of elementary vitality on one hand, and a constant, uniform, and mutual dependence of each tissue upon the due discharge of the functions of the other tissues on the other hand.

Independent life is seen in the primitive cell development of the osseous, fibrous, serous, and mucous structures; dependent life in the history of absorption, assimilation, respiration, circulation of the blood, and the whole secretory and

excretory apparatus. If absorption and assimilation were suspended the blood would be unreplenished and would cease its crimson flow. The tissues would recieve neither nourishment nor stimulus to activity. If the respiration were suspended, the blood would not be decarbonised nor oxygenated, and if circulated to the tissues, it would bear within its channels the seeds of paralysis and death.

If the fluids were not secreted, there would be no digestion, and by consequence, there would be no use of the assimilative processes. the digestion would be suspended.

If the effete and disintegrated tissues, and undigested portions of the food were not excreted they

would remain as so many irritants producing inflamations, paralysis and death.

In abnormal conditions there is a disturbance of these mutually dependent attributes in their harmonious and important functions.

Fevers are an excess of activity, burning out the vitality too rapidly for the unaffected tissues to restore

Excess of nourishment to any single part, or the whole organism, produces that condition of things we term Hypertrophy - a word signifying "excess of nourishment."

An opposite condition of things is that of Atrophy - a word derived from - a - privation and τρεφω - to nourish = not nourished. This does not express the whole of the facts.

A disappearance of the tissues more or less rapid, either from defective nutrition, or loss of functional activity; or both causes may combine to produce Atrophy, Or it may result from secondary causes, following an erethistic condition — reaction after inflammation — or the results of morbid poisoning, so that the term explains only partially that morbid condition we are considering.

In Hypertrophy, Superabundance of nutrition alone will not answer all the causes thereof; for when food above the actual demand is supplied, and by the Sanguineous Currents carried to the tissues, they will not become Hypertrophied in a State of complete inaction, or in those

morbid conditions which prevent the assimilation of their peculiar food. Best when these complex processes combine, and life's machinery acts in concert, then, every tissue, may not only grow to completeness, but over grow. In certain active states of the organism we always find hypertrophy - when constant and vigorous exercise brings into continued play certain muscles, as in the right arm of the blacksmith & stone mason; the legs of the pedestrian, and opera dancer; or in the heart, when some abnormal obstruction brings upon it an increase of labor, there is excessive development.

If the organism is involved in lopes by every muscular contraction

every sensation, every exercise of volition, and by the active use of every tissue, then it would seem to follow, that active and vigorous exercise would produce Atrophy, and a state of complete rest and nonuse - a listless, dreamy forgetfulness - would invariably be followed by Hypertrophy.

The exact reverse of this is true. The usual explanation given is this: this increase of functional activity brings an increase of blood to the parts, not only increasing the stimulation, but supplying an excess of nourishment: not producing an increased number of Muscular fibrillae, but an elargement of the Sarcous elements, and opening new capillary channels for the blood.

But is this satisfactory? The question still occurs, Why is there an increased flow of blood? Why do the currents become more active? It is not enough to say that increase of exercise produces, by the contraction of one fibrilla over another, an increase of heat mechanically; and the heat stimulates the blood to greater activity; for then artificial heat applied in the non-use of muscles would prevent Atrophy.

I think the answer lies still deeper than is yet given by Physiology.

A careful consultation of the following pages will afford a satisfactory, & to my mind, a philosophical solution of these facts.

Atrophy, we have said, is a wasting of the tissues – a gradual emaciation of the organism, until flesh and strength have both departed.

Causes of Atrophy.

Its most common and general cause is expressed in the term itself – want of nourishment. Starvation presents a frightful example of this form of atrophy. All the tissues become shriveled and exhausted, except the nerves, which holds out the longest, perhaps at the expense of all the rest.

Not only will Atrophy result if the food be withheld, but the same consequences will follow, if the process of absorption and vegetation are suspended; as in Tabes Mesenterica.

So also if there was obstruction in the circulation, as well as deficient supply of blood. then Atrophy would follow. especially in those portions of the Organism to which the obstructed vessels were accustomed to convey Nourishment.

If in the tissue itself, there exists defective power of selection, absorption, and assimilation; either from over-exercise - such as would produce rupture among the primitive elements themselves, or their attachments; or from paralysis of motor or sensory trunks; Atrophy would necessarily result.

Medicinal agents also are fruitful sources of Atrophy. They do this, either by destroying the absorptive and assimilative processes of life, or

they paralyse the nervous power of the tissue, and destroy its function; or they reach deeper still and take hold of the independent vitality of the primitive elements. Thus Iodine wastes the Mammae and the Testicles, Sulphuric acid produces rapid emaciation of the whole body, and Sia Commini says "Every one knows that acetic acid, when habitually taken, produces leanness, from a sort of languor of the digestive proceps." He relates the case of a rosy, plump, fleshy, young lady who, fearing obesity, took, upon the advice of a female friend, a small glass of vinegar daily for nearly a month. Her flesh rapidly wasted, cough and hectic fever supervened and death followed.

Atrophy results also from paralysis and nonuse of the tissues. Loss of functional activity, or the non employment thereof. contrary to a natural inference from the Physiological fact that use breaks down and disintegrates a certain amount of tissue while functionally employed, wastes the tissue rapidly and uniformly brings on emaciation. Why is this?

The answer which this essay will attempt to verify is this.

The vitality of the primitive elements of each tissue is dependent upon activity; and that in nonuse the activity is measurably absent and just so much vital power is, of course, lost and Atrophy follows.

The primitive elements of the tissues are simple cells. varying in form, duration of existence, functions and results.

The vitality of the cell is that historical phenomena appearing during its existence and growth from an organisable blastema, or a germinal nucleus, to full maturity and disintegration. But growth intimates expansion, and of course activity — progression to maturity declares functional duty, and of necessity activity — not such an activity as springs from a pre-existent vitality, but an activity which attends upon, develops, and is almost the only element, at least the only perceptible element, of vitality.

When this activity ceases, life ceases also. It is not mere motion although wherever there are vital motions there will be vital activity, but there may be activity in the germinal nucleoli and nuclei when there is no perceptible motion.

The life of the organism is a combination of activities. It is constituted and continued by the harmonious arrangement of its numerous attributes so that the functional activity of one attributes shall not only contribute to its own vitality, but the vitality of all the rest, making the Scripture declaration true "that if one member suffer all the members suffer with it." and when entire activity ceases, we say truly, "the body is dead."

If this is true of the whole, it must be true of the parts which make the whole. If the brain loses its activity, although no abnormal lesion can be detected in any other organ, yet the death of the whole follows. If the blood loses also its activity, the same results follow. So also of the respiration and its organs the lungs. The process of assimilation including the whole history of the nutritive changes, is but a display of activity. The life of the mucous epithelial cell continues while active and is thrown off so soon as activity ceases. These cells are not only active but furnished, like the body itself, with organs of activity as seen in the ciliated epithelium.

The history of reproduction is but an illustration of the proposition from the first elaboration of Semen in the male to the successful impregnation of the Ova in the Female, and from fecundation to birth.

The Spermatozoa, as long as they are capable of fulfilling their mission, are action and are possesed of organs of activity - progress and Motion. This idea will help to resolve the question of "where fecundation takes place!" Wherever the ovum is brought into contact with the action Spermatozoa of the Semen. The activity of the Spermatozoa will accomplish this; and if that activity is lost before contact is effected fecundation will not take place. On this principle we can explain

extra-uterine foetation; for motion and activity being the peculiar vitality with which the semen is endowed it is borne to the ovum either in the Ovarium, or within the peritoneal folds, previous to its entrance into the Fallopian tubes. It also answers the question how impregnation occurs when the semen is simply lodged upon the external organs of generation.

If thus we proceed to investigate the whole phenomena of existence however manifested especially in the cellular and absorption processes, it will appear, that in proportion to activity will be the amount of life and just in proportion as activity declines vital power declines also, and when

activity is wholly lost there is death.

On this principle also we account for hypertrophy in the increase of exercise and of Atrophy in non-use. Thus the heart enlarges in the increase of labor from obstructed circulation — There is increase of activity and consequently of vitality, and a superabundant growth as the result.

It is not enough to say that this labor brings an increased quantity of blood, for there must be this, and also an increased ability to use and assimilate it; just that increased vitality which springs out of an increase of activity.

In the non-use of a muscle we know this defective vitality because we know the loss of the activity on which it depends and atrophy follows.

"But," it is replied, "this theory is not in the books." What then? Are we tied up to the methods of thought and argumentation of all preceding ages and compelled to adopt the formulas and statements of book writers without the right of investigation for ourselves originally? And without questioning the authority and reasonableness of systems proposed for our reception? He who thinks and reasons only according to the set phrases and formulas of his text books, at best can only claim relationship to another biped whose only ambition is to repeat by rote the few words taught it. It is doubtless true, although not in so many words, in the books, because it, not only answers the phenomena of

observation, but furnishes a satisfactory, reasonable, and simple solution of many of those unexplained mysteries relating to this department of Physiology.

It may be further objected "that in vegitation we have vitality without activity, as in the seeds of plants, which remain physically and chemically the same for years; and yet when placed in appropriate relations to air, heat, and moisture, speedily become developed into the active plant." Admitting the truth of the assumption I reply; Perhaps in this lies the distinction between animal and vegitable life. In the animal we have vitality dependent upon activity and in the vegitable we have activity dependent upon vitality. But denying the assumption

that the activity of the germinal vesicle is absent from the seed, I answer the objection with the assertion, that it is capable of conception that there is a constant vitality, dependant upon activity in the sperma of the embryonic plant, as in the spermatozoa of the animal,—low, imperceptible, yet there so certainly, that as soon as the seed falls into its appropriate Matrix, with suitable surroundings of air, moisture, and heat, it assumes a visible activity and speedily develops the matured plant.

The law then holds good in the vegetable as well as animal kingdom that vitality is dependent upon

activity and when this activity has departed the vitality of the seed has departed also; and it matters not how genial and appropriate are its surroundings it will not vegetate.

Is there a practical question of any importance suggested by this discussion? It explains the method of preventing atrophy in paralysis. Frictions and such applications as will stimulate contraction, and consequently, activity, keeping up the constant flow of the arterial & venous currents, and quickening the nervous sensibility.

We see also in the light of

this truth the relation exercise bears to a healthy development of the Organism. Activity develops vitality and endows the System with increasing vigor and elasticity; and rational exercise, adopted to the Constitutional peculiarities and dyscrasia, becomes an indispensible pre requisite to a full development of the entire nature

There is another question which I am expected to answer before I close this thesis.

How shall Atrophy be removed when once it makes its appearance?

Bearing in mind

its various causes our first business is to remove them if possible. Keeping also in view the philosophical principle then discussed our treatment should look constantly to the increase of activity in the atrophied organ and tissue.

We may then consult, as remedial agents, Iodine in the atrophy of the glandular structures, Acetic Acid in the loss of the adipose tissues, Sulphuric Acid in muscular atrophy, and Phosphoric Acid, Calcarea Phosphorica in the wasting of the bony structures.

The Materia Medica will furnish others not forgetting the peculiar constitutional remedies essential to perfect health.